

**APPLICATION FOR
UNITED STATES LETTERS PATENT**

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

Be it known that I, William Carter
a citizen of the United States, residing at Dyer
in the County of Lake and State of Indiana
have invented a new and useful FLEXIBLE, FRAMELESS DISPLAY MODULE, DEVICE AND
METHOD
of which the following is a specification.

FLEXIBLE, FRAMELESS DISPLAY
MODULE, DEVICE AND METHOD

FIELD OF THE INVENTION

This invention relates to a flexible, frameless, non-self-supporting display module, and an illuminated display device incorporating one or more of the modules. Such devices are particularly suitable for indoor or outdoor use, such as at restaurants, for example.

BACKGROUND OF THE INVENTION

Various display boards are known in the art, such as illuminated menu display boards, which are commonly utilized at fast-food restaurants, for example, to display food items, associated pricing, advertised specials, and other information. These menu display boards are commonly used in outdoor locations at "drive through" windows and behind and above typical restaurant counters. Changes to the displayed information frequently need to be made due to customer demand, menu changes, pricing changes, or for other reasons. Thus, there is a need for a display board wherein the displayed information is easily changed and yet is of simple construction. A need also exists for a display device that can be rapidly changed from breakfast items, for example, to lunch and dinner items.

SUMMARY OF THE INVENTION

In accordance with the present invention, a flexible, self-supporting frameless display module is provided which is adapted to be disposed within an illuminated display device and is particularly suited for displaying menu information.

In accordance with one aspect of the present invention, the display module includes a flexible, non-self-supporting, at least substantially translucent sheet and a plurality of spaced apart horizontally disposed divider members positioned on one side of the sheet in fixed relation for retaining display members adjacent the sheet. Preferably, the flexible sheet is transparent. In one embodiment, each of the divider members are retained on one side of the sheet by a male connection member on each divider member which engages one of a plurality of corresponding female connection members on the sheet, such as apertures. In another embodiment, each of the divider members are held in place over the sheet by a corresponding one of a plurality of retention members which are secured over the sheet in fixed relation on a side of the sheet opposite the side on which the divider members are located.

In accordance with another aspect of the present invention, the display module includes a flexible, non-self-supporting, at least substantially translucent sheet and a plurality of spaced apart horizontally disposed divider members positioned on one side of the sheet in fixed relation for retaining display members adjacent the sheet. The divider members not only divide the sheet into a plurality of horizontal regions, but may also include a retaining structure for retaining

portions of display members bearing food descriptions, pricing information, restaurant or company information, artwork, or any other desired information in a predetermined position. Each of the divider members are held in place over the sheet by a corresponding one of a plurality of retention members which are secured over the sheet in fixed relation on a side of the sheet opposite the side on which the divider members are located. By "secured over" it is meant that the retention members may be directly secured to the sheet, indirectly secured to the sheet by an intermediate member, or integrally formed as part of the sheet.

A plurality of display members may be positioned in between spaced apart sets of divider members which are held in place by the retention members. The display members each have a translucent portion to allow light from the lighting source of the illuminated display device to shine through the display members to make the translucent portions even more visible to a consumer, for example, particularly after dark. Additionally, the display members are preferably flexible, and are preferably plastic, such that the display member may be flexed if desired in order to be inserted between two adjacent divider members. However, the display members may be of any other suitable material, typically having a translucent portion. The display members typically contain human readable information, such as menu information, for example. Any desired type of information may be present on display members.

In one embodiment, divider members are individually removable from the sheet. In another embodiment, individual ones of the divider members and display members can be removed and replaced relative to opposed retention members.

In accordance with another aspect of the present invention, the divider members include a retaining structure to retain a display member between adjacent opposed pairs of divider members. In one embodiment, the retaining structure is a longitudinally extending rib which extends substantially along the length of the divider member. When the divider members are held in a fixed position by the retention members, the display member may be maintained in a relatively horizontal position by opposed or adjacent pairs of longitudinally extending ribs on opposed or adjacent divider members.

In accordance with yet another aspect of the present invention, the divider members include opposed pairs of longitudinally extending channels wherein a display member may be retained within an opposed pair of longitudinally extending channels on two adjacent divider members when the divider members are held in a fixed position by the retention members.

In accordance with another aspect of the present invention, the divider members may be held in place by mating male and female connection members associated with the divider members and retention members respectively. By "associated" it is meant that the male connections members and female connection members are either included on, or associated with or are carried on the divider members and retention members respectively. It is contemplated that this arrangement may be reversed, with the divider members having female portions and the retention members having male portions if desired.

The mating male and female connection members not only enable the cooperation of divider members and retention members, but also provide a retaining structure for a display member disposed between any two adjacent

divider members. Preferably, the male connection members extend through a corresponding aperture located in the sheet and extend from one side of the sheet to the other side of the sheet wherein the male connection members are retained by female connection members. Alternatively, the divider and retention members may extend beyond the sides of the flexible sheet and so that no holes extend through the sheet. Additionally, the divider members preferably include a longitudinally spaced rib on each of the divider members.

In one embodiment, each of the retention members includes a plurality of spaced apart apertures, each of which define a female connection member which is adapted to be engageable with one of a corresponding opposed plurality of male connection members associated with a divider member. The retention members are located on the side of the sheet opposite the side on which the divider members are located. The male connection members engage the apertures of a corresponding one of a plurality of retention members. A display member may be retained between any two adjacently cooperated display members. Preferably, the dividing members further include a longitudinally spaced rib on each of the divider members to aid in the retention of a member between two adjacent divider members.

In accordance with one aspect of the present invention, an illuminated display device is provided which includes a housing having an opening, at least one lighting source positioned inside the housing for projecting light through the opening, and at least one display module, as previously described herein, removably disposed within the opening in the housing.

In accordance with another aspect of the present invention, a method of assembling a display module is provided. The method comprising securing together a plurality of opposed pairs of retention members and divider members and on opposite sides of a flexible non-self-supporting at least substantially translucent sheet in fixed relation and horizontally arrayed, and positioning in a retaining relationship a plurality of display members between opposed or adjacent sets of divider members, the display members having translucent portions.

Other advantages and features of the invention will become apparent from the following description and from reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective view illustrating an illuminated display device in accordance with the present invention;

FIG. 2 is a front elevation view of a display module in accordance with the present invention;

FIG. 3 is a front perspective fragmentary exploded view illustrating the cooperation of a divider member and a retention member within an illuminated display device in accordance with the present invention;

FIG. 4 is a front perspective fragmentary exploded view illustrating the cooperation of a divider member and a retention member through the sheet in a display module in accordance with the present invention;

FIG. 5 is a fragmentary side elevation view along line 5-5 of FIG. 4; and

FIG. 6 is an enlarged, fragmentary front elevation view of a female connection member in accordance with the present invention.

FIG. 7A is a fragmentary side view of a divider member having a male connection member and a sheet having a female connection member in accordance with the present invention.

FIG. 7B is a fragmentary side view of the cooperation between the male connection member cooperated with the female connection member of FIG. 7A.

DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and described in detail herein, several specific embodiments with the understanding that the present disclosure is to be considered as exemplifications of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

Referring to the figures generally and in particular to FIG. 1, a display module 10 according to the present invention is shown generally as being disposed within an illuminated display device 12. Illuminated display device 12 includes a housing 14 having a top portion 16, bottom portion 18, and side edges 20a, 20b. Housing 12 also includes an opening 22 in a front portion 24 of illuminated display device 12. Optionally, illuminated display device 12 may include a transparent or substantially translucent door (not shown) which may be connected to the housing by any suitable manner, such as by a suitable hinge or hinges.

Housing 14 further typically includes lighting source 26 spaced behind display module 10 to backlight display module 10 when display module 10 is disposed within housing 14. Lighting source 26 preferably includes fluorescent light tubes of a suitable length and wattage, but alternatively may be any other suitable lighting source can be utilized as would be recognized by one skilled in the art.

Housing 14 may be used either indoors or outdoors and thus may be formed from a relatively rigid and relatively weatherproof material, such as metal, and preferably aluminum, to protect the housing and door from the deleterious effects of sun, wind, rain, snow, freezing temperatures, and elevated temperatures, particularly when illuminated display device 12 is placed in an outdoor environment. If illuminated display device 12 includes a door, the door may also be of a relatively weatherproof material, preferably glass, but may be any other suitable transparent or substantially translucent material which is relatively weatherproof. Additionally, for outdoor use, such as "drive through" of a restaurant, housing 14 may be secured to a suitable base (not shown) mounted in the ground or a suitable supporting surface to add height and to provide stability to housing 14. Housing may further be provided with suitable venting for the interior when display module 10 is disposed within the opening of a housing having a door.

In accordance with one aspect of the present invention, display module 10 is adapted to be connected to a portion of illuminated display device 12 when display module 10 has been assembled as desired. In one embodiment, as shown in FIG. 1, illuminated display device 12 includes at least one elongated

strip of hook and loop fasteners 28, and preferably at least two elongated strips of hook and loop fasteners, which cooperate with a corresponding strip of hook and loop fasteners on display module 10 as will be discussed further in detail below.

Alternatively, any other suitable material or fasteners may be used for connecting display module 10 to front portion 24 of illuminated display device 12, including but not limited to, rivets, nuts and bolts, screws, or other threaded fasteners, clips, welds, and adhesives, for example.

Illuminated display device 12 may further include a rotating mechanism 13 which selectively changes the divider members which are visible in opening 22 of housing 14 of illuminated display device 12. In one embodiment, as shown in FIG. 1, rotating mechanism 13 includes two rotating members 29a, 29b which may move display members 30a - 30d of display module 10 along a predetermined pathway defined by a belt 15 that moves as mechanism 13 operates. Preferably, display module 10 includes at least two display modules 10, for example, one for breakfast and a group for lunch, which can travel via rotating members 29a, 29b with belt 15 along its pathway. Belt 15 can be a flexible, transparent or translucent belt having loop (or hook) fastener material in desired areas to permit the attachment of module(s) 10 thereto, which has hook (or loop) fastener material on desired areas. Such hook and loop fastener material may be Velcro®.

Display module 10 includes a flexible, non-self-supporting, at least substantially translucent sheet 32, a plurality of divider members 34a - 34d, and a plurality of retention members 36a - 36b, and a plurality of display members 30a - 30d, as shown in FIGS. 1-3.

Sheet 32 has a front side 38 and a rear side 40 and is of a flexible material, such as plastic or any other suitable at least substantially translucent material. It is contemplated that sheet 32 may be transparent, but should be at least substantially translucent so that light may pass through sheet 32 when display module 10 is disposed within opening 22 of housing 14. By “non-self-supporting,” it is meant that the sheet is not self-supporting by itself (typically because it is too flexible or not sufficiently rigid).

As illustrated, divider members 34a-d are horizontally disposed on a side of sheet 32, for example, on rear side 40 as shown, in fixed relation to sheet 32 for retaining display members 30a-d, as shown in FIG. 1. Divider members 34a-d thus divide front side 38 into a plurality of relatively horizontal regions wherein display members 30a-d may be retained between adjacent divider members in the relatively horizontal regions to display information, such as food descriptions, pricing information, restaurant or company information, artwork, or other desired information. Divider members 34a-d are preferably elongated strips of extruded plastic or extruded metal. Alternatively, any other suitable material may be used.

Divider members 34a-d are held in place on one side of sheet 32, preferably on rear side 40, by a corresponding one of a plurality of retention members 36a-d, preferably on front side 40, as shown in FIGS. 3-6. Retention members 36a-d are secured over sheet 32 in fixed relation to sheet 32 on a side opposite the side on which divider members 34a-d are located. By “secured over” it is meant that the retention members may be directly secured to the sheet, indirectly secured to the sheet by an intermediate member, or integrally formed as part of the sheet. Retention members 36a-d are indirectly secured to sheet 32

when any one of retention members 36a-d is cooperated with a respective one of a divider members 34a-d as will be discussed in detail further below. Sheet 32 is disposed between divider members 34a-d and retention members 36a-d, and retention members 36a-d are preferably located on front side 38 when divider members 34 are preferably located on rear side 40. Preferably, retention members 36a-d are carried on, associated with or included on elongated strips of extruded plastic or metal. Alternatively, any other suitable material may be used.

Additionally, the retention members may be directly secured to the sheet by suitable fasteners such as rivets, screws, adhesive, or by any other securement material or member. Further, the retention members may be extruded along with the sheet and thus be integral with sheet, preferably from plastic.

Display members 30a-d may be positioned in between spaced apart sets of divider members 34a-d which are held in place by retention members 36a-d, as shown in FIG. 1. Display members 30a-d each have a translucent portion to allow light from the lighting source of the illuminated display device 12 to shine through display members 30a-d to render the translucent portions even more visible to a consumer, for example, particularly after dark. Each of display members 30a-d may have indicia, typically human-readable indicia, on at least one side thereof bearing food descriptions, pricing information, restaurant or company information, artwork, or any other desired information. Additionally, display members 30a-d are preferably elongated flexible plastic strips, but may be any other suitable material or shape. Preferably, individual display members 30a-d are removable from the display module 10, and also preferably, individual

ones of divider members 34a-d and display members 30a-d are removable from display module 10.

Each divider member 34a-d typically includes a retaining structure to retain a portion of one of display members 30a-d. An individual one of display members 30a-d is retained between adjacent pairs of divider members 34a-d having the retaining structures. In one embodiment, as shown in FIG. 4, the retaining structure is a longitudinally extending rib 44 which extends longitudinally along at least a portion of the entire length of divider member 34a, and preferably extends longitudinally along the entire length of divider member 34a. When divider members 34a-d are held in a fixed position by retention members 36a-d, display members 30a-d may be maintained in a relatively fixed horizontal position by opposed pairs longitudinally extending ribs 44 on opposed pairs of divider members 34a-d, for example.

In accordance with another embodiment of the present invention, divider members 34a-d may include an opposed pair of longitudinally extending channels (not shown) within a top edge or bottom edge of the divider member for retaining the display member. Preferably, the channels extend longitudinally along at least a portion of the entire length of divider member, and preferably the longitudinally extending channels extend longitudinally along the entire length divider member. When divider members 34a-d are held in a fixed position by retention members 36a-d, a display member may be maintained in a relatively fixed horizontal position by any pair of opposed longitudinally extending channels.

Another embodiment of the invention is shown in FIG. 3. Display module 10 is incorporated into an illuminated display device 112 that includes a housing

114, a top portion 116, and side 118 (only the left side 118 is illustrated), light source 126 and Velcro® loop fastening members 128 and optionally a door (not shown). Display module 10 can be conveniently secured within housing 114 by attaching hook fasteners 130 of display module 10 to loop fasteners 128 of housing 114. Obviously, the location of hook and loop fasteners 128 and 130 can be reversed, if desired.

In one embodiment, each of divider members 34a-d is held in a fixed horizontal position relative to the sheet by mating male connection members 46 and female connection members, for example as in apertures 54, associated with the divider members 34a-d and retention members 36a-d respectively. By “associated” it is meant that male connections members 46a-d and female connection members are either included on, are carried on or are otherwise secured to, divider members 34a-d and retention members 36a-d respectively. Thus, it is contemplated that male connection members 46 may be integrally formed with divider members 34a-d and the female retention members, as in apertures 54, may be integrally formed with retention members 36a-d, preferably from extruded plastic or metal.

Preferably, each of male connection members 46 extend through corresponding sheet apertures 52 located in sheet 32 and extend from one side of sheet 32 to the other side of sheet 32, and preferably from rear side 40 to front side 38 of sheet 32. Further, as shown in FIG. 4, each male connection member 46 preferably includes a groove 50 to aid in securing each male connection members to a corresponding female connection member, as in for example, aperture 54. The female connection members are preferably four spaced apart

apertures 54, as shown in FIGS. 4-6. Alternatively, the female retention members may include any female member which will accept any one of male connection members 54a-d. One of display members, such as display member 30a may then be held in place by cooperation of male connection member 46 with aperture 54 of retention member 36a, as shown in FIGS. 4-5, which includes a plurality of radially outwardly extending slots 55 which permit the expansion of aperture 54a during insertion of male connection member 46 followed by a subsequent retraction of aperture 54 over member 46..

In another embodiment, where display module 10 preferably is not subjected to a great deal of movement or stress, each divider member 34a-d may not require a corresponding retention member 36a-d to be retained in fixed relation to sheet 32. Thus, for example, divider member 44 in FIG. 4 could be secured to sheet without the aid of retention member 36a. Instead, each divider member 34a-d has a male connection member 46 which cooperates with one of a plurality of corresponding female connection members on sheet 32, preferably as in aperture 52, for example, as shown in FIG. 7A. Additionally, each male connection member 46 preferably has a retaining structure such as a bulb 60, flange, barb, lip, slit, groove, or other suitable structure which cooperates with the aperture 52 when at least a portion of male connection member 50 is inserted through aperture 52 of sheet 12, as shown in FIG. 7B. Aperture 52 may include a plurality of radially outwardly extending slots (not shown) which permit the expansion of the aperture during insertion of male connection member 46 followed by a subsequent retraction of aperture 52 over member 46. When the

male connection member 50 is inserted through aperture 52, each divider member 34 is maintained in fixed relation to sheet 12.

Male connection members 46a-d not only enable divider members 34a-d to be cooperated with retention members 36a-d, but male connection members 46a-d also provide a retaining structure for retaining a portion of any one of display members 30a-d. In particular, a single one of display members 34a-d may be retained between any two divider members 34a-d having male connection members 46a-d. It is contemplated that divider members 34a-d may include four or more male connection members 46a-d and any of retention members 36a-d may include a corresponding four or more female connection members to fully support display members 30a-d between two adjacent pairs of display members. Divider members 34a-d may further include a longitudinally extending channel or longitudinally extending rib 44, as shown in FIG. 4 and as described herein, to retain a display member 30a in between any two adjacent divider members. Each male connection member 46a preferably extends from longitudinal extending rib 44, as is also shown in FIG. 4.

In accordance with another aspect of the present invention, sheet 32 includes hook fasteners 56, on at least a top portion 58 of sheet 32, as shown in FIG. 1, which is adapted to be mated with elongated strip of loop fasteners 28 on top portion of sheet 32. Further, sheet 32 preferably includes further areas having hook fasteners which are matable to corresponding portions of loop fasteners on housing 14 such that display module 10 can be further retained to housing 14.

In operation, flexible, non-self-supporting frameless display module 10 is assembled as follows from its components. As shown in FIG. 3 and more closely in FIG. 4, preferably, divider member 34a is pushed flush against rear side 40 of sheet 32. If divider member 34a includes a male connection member 46a, male connection member 46a is pushed through corresponding aperture 52a in sheet 32 such that male connection member 46a extends from one side of sheet 32 to the other side of the sheet 32. The female connection member, aperture 54a, of retention member 36a can then be placed over male connection member 46a and secured, as shown in FIGS. 4-5.

Subsequently, display member 30a may be placed on a top portion of extending longitudinal rib 44 if divider member 34a has rib 44, as in FIG. 4. If divider member has a longitudinally extending channel (not shown), the display member may be placed substantially within the channel. It is contemplated that display member 30a may be pushed flush against rear side 40 of sheet 32 collectively with a first divider member 30a when first divider member 34a is assembled, and subsequently secured to sheet with a second divider member which is assembled as described above.

After a first display member 30a is associated with at least one divider member 34a, a second opposed display member 34b may be assembled as described above and as shown in FIGS. 3-5, for example, vertically above or below the first assembled divider member to fully secure a display member 30a in place. Further, the above method may be repeated for as many divider members as are desired to be displayed. It is contemplated that not all available

retention members and divider members need be used to incorporate larger display members in the display module.

If a display member is desired to be changed, any one of display members 30a-d may easily be removed and replaced by simply pulling any one of retention members 36a-d in a direction away from sheet 32. If the retention members are directly secured to sheet or are integral with the sheet, the display member may be pulled in a direction away from the sheet to access the display member.

The assembled display module may be inserted into opening 22 of housing 14 of illuminated display device 12, as shown in FIG. 1. For example, in the embodiment where display module 10 includes a hook fastener portion 56 and housing 14 includes a mating loop fastener portion 28 (or 128 in FIG. 3), the corresponding portions may be mated with one another. Such material may be Velcro®, for example. After fastening, illuminated display device 12 is fully assembled and lighting source 26 may be powered to yield a menu display device where the displayed information is illuminated.

While the invention has been described with respect to certain preferred embodiments, it is to be understood that the invention is capable of numerous changes, modifications, and rearrangements without departing from the scope or spirit of the invention as defined in the claims.